

## ABSTRACT

In a hydrogen gas line where the composition of the gas is primarily hydrogen, impurities present in the gas line will typically reduce the speed of sound. Accordingly, an acoustic sensor can be used in such a hydrogen gas line to indicate when impurities have accumulated in the gas line. In particular, the hydrogen gas line may be in a fuel line for an electrochemical fuel cell system. The sensor may comprise transducers, more particularly piezoelectric transducers, as both sound detectors and/or sound generators. Further, the sensor can measure either the speed or frequency of sound to determine the hydrogen concentration. If the fuel is recirculated back to the anode inlet, such a hydrogen sensor in the anode exhaust may be used to determine when it is beneficial to purge the anode exhaust to the external atmosphere.

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